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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/733,269  | 12/12/2003  | Taiji Torigoe        | 246584US-6CONT      | 8642             |
| 22850   | 7590        | 11/26/2004           |                     |                  |
| OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.<br>1940 DUKE STREET<br>ALEXANDRIA, VA 22314 |             |                      |                     |                  |
| EXAMINER<br>TUROCY, DAVID P   |             |                      |                     |                  |
| ART UNIT  |             | PAPER NUMBER         |                     |                  |
| 1762  |             |                      |                     |                  |

DATE MAILED: 11/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/733,269

Applicant(s)

TORIGOE ET AL.

Examiner

David Turocy

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 10/20/2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. Applicant's arguments and amendments filed 10/20/2004 have been fully considered and reviewed by the examiner, but they are not persuasive. The examiner acknowledges the cancellation of claim 5 and the amendment of claim 9. In light of the amendments, the 35 USC 112 rejection of Claim 9 is withdrawn. Claims 1-4 and 6-9 are pending.

### ***Information Disclosure Statement***

2. The information disclosure statement filed 12/12/2003 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent or publication listed that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Khan et al. (2002/0164417 A1).

Khan teaches a method of repairing a Ni-based alloy part having an undercoat (bond) layer and a topcoat (thermal barrier coating, TBC) (abstract; p. 2). Khan teaches removal of the TBC and bondcoat only in localized areas of damage, followed by replacement with another undercoat layer, such as by slurry spraying (P26), and with another topcoat layer.

Regarding the base material temperature at spraying, Khan does not teach a specific temperature. However, in the absence of a showing of criticality, it is Examiner's

position that selection of room temperature and conditions, which lie below 300 °C, as required by Applicant in claim 1, would have been obvious to an ordinary artisan.

Additionally, Kahn teaches drying after coating at a temperature of 20-100°C, lying within the range claimed by Applicant. Regarding the spray particle speed required by Applicant, Examiner notes that Kahn does not teach a spray velocity for his slurry-spraying step. In the absence of a specific, critical teaching by Khan, it would have been obvious to one of ordinary skill in the art to select a velocity suitable for a given method based on the speed with which the repair must be performed and the amount of force tolerable by the substrate. It is well settled that determination of optimum values of cause effective variables such as these process parameters is within the skill of one practicing in the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980).

Regarding claims 2-3, the replacement coatings of Kahn are selected for use in gas turbine engines of harsh environments and are known for excellent oxidation resistance.

2. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rigney et al. (6,274,193).

Rigney teaches repairing Ni-based alloy parts having an undercoat (metallic environmental resistant coating) and a topcoat (TBC) by removing the topcoat layer and undercoat layer corresponding to the damaged area and subsequently spraying another

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undercoat layer thereon and applying another topcoat layer (abstract; Figure 2; col. 3, line 33; col. 4, line 13-24; col. 5, lines 34-44; col. 6). Rigney teaches local repair because complete removal of a layer results in detrimental wall thinning of the base part.

Rigney teaches that the undercoat, the metallic layer, may be applied by spraying (col. 6, line 7).

Regarding the base material temperature at spraying, Rigney does not teach a specific temperature. However, in the absence of a showing of criticality, it is Examiner's position that selection of room temperature and conditions, which lie below 300 °C, as required by Applicant in claim 1, would have been obvious to an ordinary artisan.

Regarding the spray particle speed required by Applicant, Examiner notes that Rigney does not teach a spray velocity for his slurry-spraying step. Therefore it would have been obvious to one of ordinary skill in the art to select the cause-effective variable, such as velocity, suitable for a given method based on the speed with which the repair must be performed and the amount of force tolerable by the substrate for those reasons outlined above.

Regarding claims 2-3, the replacement coatings of Rigney are selected for use in gas turbine engines of harsh environments and are known for excellent oxidation resistance.

Regarding claim 4, Rigney teaches that the replacement TBC may be applied by electron beam physical vapor deposition (col. 6, line 40).

3. Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Khan or Rigney in view of Sangeeta (6,485,780).

Khan and Rigney teach that which is disclosed above regarding spray-coating the new undercoat layer for a Ni-based alloy part as required by claim 1, but fail to teach the reduced pressure used, as required by claim 6.

Sangeeta teaches a method of repairing similar products in which a replacement metal is applied to the substrate while diffusion heat treating, such treatment is said to occur in inert gas atmosphere or in a vacuum (col. 8, line 8; col. 7, line 31).

Since Khan and Rigney teach application of metal repair coatings similar to that of Sangeeta, and Sangeeta teaches that inert gas atmosphere or a vacuum may be used during such repair coating, Sangeeta would have reasonably suggested the use of reduced pressure in the method of Khan or Rigney. It would have been obvious to one of ordinary skill in the art to use vacuum pressure conditions, using the teachings of Sangeeta, in the methods of either Khan or Rigney because Sangeeta teaches the interchangeability of atmospheric inert gas conditions and vacuum conditions in such

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repair coatings. Additionally, in the absence of a showing of criticality, selection of a suitable pressure by an ordinary artisan would have been obvious as a cause-effective variable, as outlined above.

The remaining limitations of claim 6 have been addressed regarding claim 1, above.

The limitations of claims 7-8 have been addressed above in regards to claims 2-3.

Regarding claim 9, electron beam PVD of the TBC is taught by Rigney, as outlined above. Regarding the limitation of applying the basecoat by plasma spray, Examiner notes that Khan and Rigney teach spraying and that Khan teaches that the localized repair methods avoid the use of the traditional methods of recoating damaged substrates by plasma spraying. While it is taught to be unneeded in such local repair, it is Examiner's position that application by plasma spraying is taught to be well-known in the art and would have been an obvious type of spraying for use in the methods of Khan or Rigney in view of Sangeeta.

### ***Response to Arguments***

5. Applicant's arguments filed 10/20/2004 have been fully considered but they are not persuasive.



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6. The applicant has argued against the Khan et al reference, stating that it does not teach or even suggest a spraying velocity of 300 m/s or more or a base-material temperature of 300°C or less.

Regarding the spraying velocity of 300 m/s or more. The showing of criticality of a spray velocity of 300 m/s or more is unsubstantiated by a showing of fact. Khan makes no reference to a specific spray velocity, but inherently has a spray velocity. However, it is the examiners position that it is within the skill of one of ordinary skill in the art to select a spray velocity high enough for the particles to reach the substrate but low enough as to not cause disrupt to the process, i.e. damage the substrate, damage the spray particles, and/or damage the adhesion of the particles because they are bouncing off the substrate. In addition, the examiner feels the amount of time determines the formation of a oxide film or not, rather than the specific spray velocity of the particles. Therefore, since there is no showing of a specific velocity by Khan, it would have been obvious to optimize the value for the spray velocity to provide a proper repair of the substrate.

Regarding the base-material temperature, Khan makes not reference to a specific temperature, but does suggest drying the applied mixture at a moderate temperature of 20°C – 100°C. Since drying of the applied mixture occurs at such a temperature, it would have been obvious to one of ordinary skill in the art at the time of the invention to form another undercoat layer by spraying performed in the atmosphere at room temperature, prior to drying the layer at the required temperature, which lies below 300°C, as required by applicants claim.

7. The applicant has argued against the Rigney et al reference, stating that it does not teach or even suggest a spraying velocity of 300 m/s or more or a base-material temperature of 300°C or less.

Regarding the spraying velocity of 300 m/s or more. The showing of criticality of a spray velocity of 300 m/s or more is unsubstantiated by a showing of fact. Rigney makes no reference to a specific spray velocity, but inherently has a spray velocity. However, it is the examiners position that it is within the skill of one of ordinary skill in the art to select a spray velocity high enough for the particles to reach the substrate but low enough as to not cause disrupt to the process, i.e. damage the substrate, damage the spray particles, and/or damage the adhesion of the slurry because of bouncing off the substrate. In addition, the examiner feels the amount of time determines the formation of a oxide film or not, rather than the specific spray velocity of the particles. Therefore, since there is no showing of a specific velocity by Rigney, it would have been obvious to optimize the value for the spray velocity to provide a proper repair of the substrate.

Regarding the base-material temperature, Rigney makes not reference to a specific temperature, and without a showing of a specific temperature for the base-material it would have been obvious to one of ordinary skill in the art at the time of the invention to form another undercoat layer by spraying performed in the atmosphere at room temperature, which lies below 300°C, as required by applicants claim.

8. Applicant has argued against both Khan et al and Rigney et al, stating that neither reference teaches a method of spraying at a particle speed of less than 300 m/s. The showing of criticality of a spray velocity of 300 m/s or less is unsubstantiated by a showing of fact. While neither reference suggests a spray velocity, both references inherently have a spray velocity. It is the examiners position that it is within the skill of one of ordinary skill in the art to select a spray velocity high enough for the particles to reach the substrate but low enough as to not cause disrupt to the process, i.e. damage the substrate, damage the spray particles, and/or damage the adhesion of the slurry because of bouncing off the substrate. In addition, the examiner feels the amount of time determines the formation of a oxide film or not, rather than the specific spray velocity of the particles. Therefore, since there is no showing of a specific velocity by Kahn or Rigney, it would have been obvious to optimize the value for the spray velocity to provide a proper repair of the substrate.

### ***Conclusion***

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

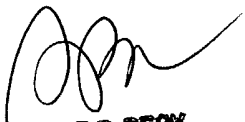
extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Turocy whose telephone number is (571) 272-2940. The examiner can normally be reached on Monday-Friday 8:30-6:00, No 2nd Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (571) 272-1415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

David Turocy  
AU 1762

  
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